

**UNITED STATES DISTRICT COURT
DISTRICT OF NEW JERSEY
TRENTON VICINAGE**

ASSOCIATION OF NEW JERSEY
RIFLE & PISTOL CLUBS, INC., et
al.

Plaintiffs,

v.

MATTHEW PLATKIN, et al.

Defendants.

MARK CHEESEMAN, et al.

Plaintiffs,

v.

MATTHEW PLATKIN, et al.

Defendants.

BLAKE ELLMAN, et al.

Plaintiffs,

v.

MATTHEW PLATKIN, et al.

Defendants.

) HON PETER G. SHERIDAN

) Civil Action No. 3:18-cv-10507-PGS-
) LHG

) Civil Action No. 3:22-cv-4360-PGS-
) LHG

) HON. PETER G. SHERIDAN

) Civil Action No. 1:22-cv-4397-PGS-
) LHG

REPLY DECLARATION OF EMANUEL KAPELSOHN

I, EMANUEL KAPELSOHN, hereby depose and state:

1. I am over the age of 18 and am competent to testify to the matters stated below based on personal knowledge.

2. I have attached a copy of a Rebuttal Expert Report I have prepared (attached hereto as Exhibit A). The opinions expressed in this report are based on my knowledge, skill, experience, training, and education, and I hold these opinions to a reasonable degree of professional certainty. I hereby adopt and incorporate my expert report in this declaration as if set forth in full detail.

3. The following link contains several items I produced on August 31, 2023 in response to questions at my deposition, including my errata sheet, several old items (e.g. a spreadsheet for an article I am writing on 9mm pistols) and old videos (glass penetration testing I did for church and synagogue clients) I found in response to questions I was asked.

4. There is also a video demonstrating sheetrock/wall penetration called “Sheetrock Penetration Testing.mp4” that I made specifically for this case in response to questions at my deposition:

<https://app.box.com/s/z2kbhjbelg23d8wrslciancosylex463>

5. I also note to the Court that I have been retained by the State of New Jersey as a firearms expert to testify on the State’s behalf in *Gordon v. Wetzel, Gurbir Singh Grewal, Patrick J. Callahan, et al.*, U.S. District Court, D.N.J., Camden Vicinage, Case No. 1-21-CVI-04861 (KMW-AMD). The case involves the fatal shooting of Maurice Gordon, Jr. by New Jersey State Trooper (Staff Sgt.) Randall Wetzel on the Garden State Parkway. I am an expert witness for the defendants. My relevant areas of expertise and expected areas of testimony in this case include, among others, firearms, firearms training, defensive tactics, weapon retention, holsters and holster

design, police tactics and procedures, and self-defense by Sgt. Wetzel.

I declare under penalty of perjury on this 14th day of December 2023, that the foregoing is true and correct.



EMANUEL KAPELSOHN

Dated: December 14, 2023



The Peregrine Corporation

Specialists in Defense Dynamics

July 17, 2023

Daniel J. Schmutter, Esq.
Hartman & Winnicki, P.C.
74 Passaic Street
Ridgewood, NJ 07450

Re.: Reply Report - Ellman, et al. v. Platkin, et al., and Association of New Jersey Rifle & Pistol Clubs, Inc. et al. v. Platkin, et al.

Dear Attorney Schmutter:

I am writing to reply to the reports of the defendants' expert witnesses in the two above-referenced cases, and to supplement my initial report dated June 15, 2023 in these cases.

Preparation. In preparation, I have read the reports of defendants' expert witnesses Randolph Roth, Daniel W. Webster, Dennis Baron, James E. Yurgealitis, Louis Klarevas, Robert J. Spitzer, Saul Cornell, Lucy P. Allen, and Stephen Hargarten. In addition, I have reviewed various research materials in my own library, on the internet, and elsewhere, spoken with several individuals with information on Revolutionary War era arms and accoutrements, visited the Washington Crossing Historic Park and inspected several items in the museum's collection there. The most significant of the sources I researched are cited below.

Additional Details on My Qualifications for Rendering Opinions. In addition to my qualifications, training, experience, and education outlined in my June 15, 2023 report and in my curriculum vitae provided at that time, I would now include the following details, which are of particular relevance in replying to the reports of defendants' expert witnesses:

For many years I have owned and fired black powder, muzzle-loading, flintlock firearms of the same general type in use during the American Revolution, and during the period immediately following the Revolution when the Second Amendment was written and adopted. I also have friends and acquaintances who are "re-enactors" of Revolutionary War and Civil War battles.

I have done many types of ballistic testing for the past 45 years, including accuracy testing, trajectory calculations, velocity measurements using electronic chronographs, firing of projectiles into ballistic gelatin, water, and other media, ricochet studies, and penetration testing by firing projectiles at car windshields and other automotive glass, tempered and laminated safety glass, autobody sheet metal, entire automobiles, steel armor plates of various

specifications, wood, sheetrock, plexiglass, polycarbonate, glass-reinforced plastic, soft body armor, and other materials.

I have been a hunter since my teenage years. I have hunted in New Hampshire, Connecticut, New York, New Jersey, Pennsylvania, Ohio, Indiana, Louisiana, and Alabama. I have hunted deer in five of those states. Among other animals, I have hunted game birds and waterfowl, small game, coyotes and other varmints, deer, bear and wild boar, and have taken animals ranging in size from a few ounces to 1,800 pounds. I have attended hunter safety or hunter education classes in three states. I have worked as an expert witness in hunting accident cases in several states and Canada. I am generally familiar with hunting laws and methods, and the types of firearms and ammunition used for hunting, in many parts of the United States.

I hold a bachelor's degree in English Literature with honors from Yale University. I have authored, edited or helped to edit over 130 published works in the firearms field, including a 348-page work, *Standards & Practices Reference Guide for Law Enforcement Firearms Instructors*, IALEFI 1995, of which I was the Associate Editor and Preston Covey, a professor at Carnegie Mellon University, was Editor. This work is a combination of a glossary of firearms terms, and short articles on key topics. I have been Technical Editor of *Police Marksman* magazine, and have served on the editorial boards of *The Firearms Instructor* and *Special Weapons and Tactics* magazines. Although I do not have the academic credentials in linguistics of defendants' expert Dennis Baron, I believe that my extensive background, training and study in firearms and firearms terminology more than makes up for that when the issue is whether a modern firearm's "magazine" is the "present day analog" of the Revolutionary War soldier's "cartridge box," which is the argument made by Dennis Baron in his expert report.

Discussion and Analysis

Rate of Fire. Throughout the report of defendants' experts, the experts state "rates of fire" of various firearms. For example, on page 16 of his report, Robert Spitzer states that "[a] Tommy gun could fire "an astonishing 1,500 rounds per minute. A Tommy gun could go through a 100-round drum magazine in four seconds. Later versions fired 600 to 700 rounds per minute." Yes, it would indeed be "astonishing" if a Thompson submachine gun could actually fire 1,500 rounds per minute or, for that matter, even 600 to 700 rounds per minute in actual field use, except in an extremely contrived situation. The truth, however, is to the contrary.

The Court should understand that the above numbers are not actual rates of fire of the stated firearms. Instead, the stated rates are the theoretical cyclic rates of fire of the firearms – that is, how fast the mechanism of the firearm cycles from shot to shot, and would therefore, theoretically, fire within one minute given an uninterrupted source of ammunition. For instance, given that our military's M16A1 and A2 rifles had a cyclic rate of fire of approximately 750 rounds per minute, if the trigger were held rearward in the fully automatic mode, the rifle would empty a 30-round magazine in about 2.4 seconds, which is about 12.5 rounds (shots) per second. That is, of course, without any consideration of accuracy or hitting any target. It is simply, as shooters might say, "turning ammunition into noise." If it would then take the infantryman 5 seconds to eject the empty magazine, withdraw a fresh magazine from his magazine pouch, insert the fresh magazine into the rifle, close the rifle's bolt to ready it for firing, and reposition

his hands on the rifle for firing, the actual rate of firing would be 30 rounds in 7.4 seconds. Assuming the infantryman has enough loaded 30-round magazines within easy reach to continue repeating this process at this speed for 60 seconds – which is unlikely – the actual number of rounds fired in that minute would be 243, not the “750 rounds per minute” indicated by the theoretical cyclic rate of fire. And again, even the actual 243 rounds per minute maximum rate of fully automatic fire does not take into account the time it actually takes a shooter to identify a target, aim at it, and press the trigger in a manner that achieves a hit on the target. Moreover, the standard “load-out” for an infantryman with our current 5.56mm M4 rifle (the current version of the M16) is seven 30-round magazines, or 210 rounds. So even the example of firing 243 rounds in 60 seconds is theoretical, not actually achievable by a U.S. infantryman. In addition, some of our issued 5.56mm rifles cannot fire fully-automatically, but have a 3-round burst limitation. In other words, if the trigger is pulled and held to the rear, only three shots will be fired from those rifles until the trigger is released and pulled again, not a continuous stream of shots. This is indicative of the fact that fully-automatic fire against point targets (specific targets) is generally inaccurate, ineffective, and wasteful of ammunition.

The bottom line of this discussion is that cyclic rates of fire given by defendants’ experts are of only technical, theoretical interest. In actual use, the firearms cannot be fired that quickly, and if they were fired fully-automatically at all, the result would typically be very inaccurate fire and a quick cessation of the engagement when the shooter exhausts his ammunition supply.

Finally, the Court should understand that the firearms at issue in these lawsuits are not fully automatic firearms at all – they are semi-automatic firearms that fire one shot each time the trigger is pulled once. In order to fire another shot, the user must release the trigger, and pull it again, and so on for each shot fired. Fully automatic weapons – “machine guns” – have been highly regulated by the federal government since the adoption of the National Firearms Act in 1934. New Jersey statutes prohibit the possession of machine guns by private individuals “unless the public safety and welfare so requires.” In other words, private possession of machine guns, while permitted in many other states, is basically prohibited in New Jersey. Therefore, the defense experts’ citation of the cyclic rates of fully automatic fire for guns discussed in their reports is irrelevant to the issues before the Court, and appears to be simply an attempt at sensationalism.

Revolutionary War Cartridge Boxes Compared to Modern Magazines. Defendants provide the report of Dennis Baron, a linguistics professor. In his report, Mr. Baron goes to great lengths to show that, at the time of the Revolutionary War, a soldier’s musket, bayonet, and sword (if he carried one) were called “arms,” while the soldier’s cartridge box was considered a military “accoutrement,” not an “arm.” Defendants’ expert Saul Cornell makes a similar “accoutrements” argument.

The soldier’s cartridge box was a leather pouch, typically measuring about 10” long by 4-1/4” high by 3-1/2” deep, with a wooden insert with holes drilled in it, holding between 18 and 24 tubular paper cartridges, carried on the soldier’s belt or by a strap over his shoulder. Mr. Baron’s argument is that when the Founding Fathers, in the Second Amendment, provided that “the right of the people to keep and bear Arms, shall not be infringed,” they meant to safeguard

the people's right to their muskets and rifles, but not to their cartridge boxes! Putting aside for the moment the absurdity of the argument that the Second Amendment might have given people the right to keep and bear their muskets and rifles for defense of themselves and the nation, but did not give them the right to have the ammunition that would make the muskets and rifles usable, Mr. Baron goes on to make the critical, but fallacious, argument that "the cartridge box [is] the historical analog to magazines." See D. Baron Report at p. 19. Contrary to the professor's argument, however, the modern magazine is not the "analog" of the Revolutionary War soldier's cartridge box.

A firearm's magazine is:

the part of a firearm containing the reserve ammunition supply, and **out of which cartridges are mechanically fed to the chamber for firing.** (emphasis supplied)

The Illustrated Book of Guns, David Miller, Editor, "Glossary" p. 298 (2004). And see the *Oxford English Dictionary*, which defines "magazine" in sense IV(b) as:

A container or (detachable) receptacle in a repeating rifle, machine-gun, etc., containing a supply of cartridges **which are fed automatically to the breech.** (emphasis supplied)

This definition is cited by Mr. Baron himself, see D. Baron Report at p. 28.

The New Jersey statute itself defines a "large capacity ammunition magazine" as:

... a box, drum, tube or other container which is capable of holding more than 10 rounds of ammunition **to be fed continuously and directly therefrom into a semi-automatic firearm.** (emphasis supplied)

NJS 2C:39-1(y).

The Revolutionary War soldier's cartridge box did not feed cartridges into the chamber of his musket or rifle. Instead, it simply carried the paper cartridges, simplifying the soldier's task of putting powder into the flash pan, and more powder, followed by the musket ball and perhaps several buckshot (see below), into the muzzle – not the chamber -- of the musket or rifle. The cartridge box was, as its name states, simply a box for carrying cartridges.

Firearms magazines take a variety of forms. Some are fixed, integral parts of the firearm, while others are detachable. Examples of fixed magazines include tubular magazines such as those commonly found on pump-action shotguns (e.g., Remington 870 and Mossberg 500/590), some .22 rimfire rifles (e.g., Winchester Model 61 and Henry Classic Lever Action .22), and the iconic lever-action Winchester Model 94 and the Marlin Model 336. There are also fixed box magazines, such as those on the 1903 Springfield rifle used in World War I, the Remington Model 700 ADL bolt-actions, the Soviet SKS rifle, and the U.S. M1 Garand rifle used in World War II. Some fixed box magazines, such as that of the Remington Model 700, are

loaded by hand. Others, such as those of the Springfield and SKS, can be loaded by hand or by use of a “stripper clip.” The fixed box magazine of the M1 Garand is loaded with an 8-round “en-bloc clip.” All of these fixed magazines, whether tubular or box-shaped, have a spring and follower mechanism that pushes the cartridges into position to be chambered when the pump-action, lever-action, bolt-action, or semi-automatic mechanism of the firearm moves the bolt or breechblock forward into battery for firing.

Detachable box magazines are usually rectangular in shape and, like fixed magazines, contain a spring-and-follower mechanism that pushes the cartridges into feeding position against the feed lips at the top of the magazine. Magazines of this type are generally inserted into what is called the “magazine well” of the firearm, where they are held in place by the magazine catch (or “magazine release,” in some manufacturers’ terminology). Examples of magazines of this type are the detachable box magazines of the Colt 1911 pistol and its many variants, the Browning P35 Hi-Power, almost all other modern semiautomatic pistols, the Ruger 10/22 rifle (which uses a rotary-design detachable box magazine), the Ruger Mini-14, the Springfield M1A, the AR-15 rifle, the AK-47 rifle, and almost all other modern semiautomatic rifles. Detachable magazine-fed firearms, whether pistols or rifles, are invariably sold by their manufacturers along with at least one, and sometimes two or three, magazines accompanying the firearm. The magazine, while detachable, is considered a part of the firearm. Without the magazine, the firearm could not be operated in its intended manner, and would be relegated to being loaded one cartridge at a time by hand by the user, and firing, at most, a single shot at a time. In fact, some such firearms are extremely difficult or, for some shooters, impossible, to load one cartridge at a time by hand in this way, and many such firearms are damaged if repeatedly loaded and fired this way, rather than in the intended manner using a magazine. Some firearms with detachable box magazines, typically semiautomatic pistols, have what is called a “magazine disconnect” or “magazine safety,” and cannot be fired at all with the magazine removed from the firearm. Designed by John Browning shortly after 1900, magazine disconnects have been used in pistols made by Colt, Smith & Wesson, Browning, and other manufacturers, the intended purpose being to prevent the accidents that sometimes occur when ignorant gun users remove the magazine from a pistol, believing they have “unloaded” the pistol, when in fact a round still remains in the pistol’s chamber. Pistols of this design make it clear, as do other firearms designs, that the magazine is a critical part of the firearm itself, not the “modern analog of the cartridge box” – a simple pouch for carrying cartridges, to be loaded into the flintlock by hand by the Revolutionary War soldier.

In contrast to a firearm’s magazine, which not only contains the firearm’s supply of cartridges waiting to be fired, but mechanically feeds the cartridges into the gun’s chamber for firing as the action (the moving parts) of the gun operates, a Revolutionary War soldier’s “cartridge box” was just that – a box holding cartridges. The cartridge box was not a “part of a firearm.” It was just a box, carried on the soldier’s belt or by means of a shoulder sling, in which the soldier carried cartridges. The soldier’s musket or rifle could be operated without a cartridge box; the soldier could – and some did – carry his cartridges in his pocket, or in some other sort of pouch, or could carry his powder in a powder horn, and his lead musket balls or rifle balls separately. The cartridge box was a more convenient way to carry ready-prepared paper cartridges, and allowed soldiers in formation to have a uniform appearance, but it was not a necessary part of the soldier’s musket or rifle.

Unlike the detachable box magazine of the AR-15 or AK-47, that is inserted into the rifle's magazine well and, by means of its spring-loaded magazine follower, elevates each self-contained metallic cartridge into feeding position in the magazine's feed lips so that the reciprocating movement of the rifle's bolt can chamber a fresh cartridge after each shot is fired, the Revolutionary War cartridge box had no such mechanism. In fact, it contained no mechanism at all. At the time of the Revolution, and for many years thereafter, metallic cartridges as we know them today did not exist. Designed to make loading the musket more efficient, cartridges were made of paper, about the weight of newspaper (and in fact newspaper was sometimes used for the purpose), rolled around a wooden dowel into the form of a cylinder or tube. The musket ball (or "buck and ball," see below) was positioned in one end of the tube, which was closed by twisting or folding the paper, or by tying it with a thin string. The tube was tied or twisted off just below the projectile(s) as well, the bottom section of the paper tube was filled with the black powder propellant, and the bottom end of the tube was closed in some manner (twisting, tying, or folding) to hold the powder in the tube. Cartridges of this sort were purchased from ammunition suppliers by the British and American governments for use by their troops, or sometimes the troops would make their own cartridges using paper, string, musket balls, and black powder.

To load his musket, the Revolutionary War soldier would first have to half-cock his musket to allow access to the priming pan. He would then open the leather flap of the cartridge box, then (in many cartridge box models) raise a secondary leather flap designed to protect the cartridges from the rain or snow, and then, using his fingers, pull a paper-wrapped cartridge from one of the holes drilled in the wooden cartridge box insert. The soldier would then tear open the end of the cartridge containing the powder – in battle, usually by biting it off with his teeth – and would pour a small amount of the powder into the musket's priming pan (flash pan), closing a metal piece called the musket's frizzen to keep the priming powder in place. The soldier would then pour the rest of the powder down the musket's muzzle, insert the musket ball (or "buck and ball," see below) into the muzzle -- generally along with the cartridge paper -- and would use the steel ramrod, withdrawn from its holder below the barrel of his musket, to ram the projectile(s), powder and paper down the barrel. The soldier would then replace the ramrod in its position below the musket's barrel.

To fire the musket, the soldier would cock (i.e., pull rearward) the musket's lock holding the flint (these were "flintlock" weapons at the time of the Revolution), aim, and pull the trigger. Pulling the trigger released the spring-loaded lock to rotate forward, bringing the musket's flint into contact with the frizzen. This pushed the frizzen open and resulted in a shower of sparks into the flashpan, sending sparks and flame through the touchhole into the chamber of the barrel to ignite the main powder charge and propel the projectile(s) down the barrel and out the muzzle toward the target. See generally, *Soldier of the American Revolution*, D. Hambucken and B. Payson, p. 26-35 (2011); and *Small Arms and Ammunition in the United States Service*, B. R. Lewis, published by the Smithsonian Institute (1956). A well-trained soldier is said to have been able to fire three or more shots per minute, although two shots per minute appears more likely on average. See, e.g., "Warfare History: Revolutionary War Weapons: The Brown Bess Musket," Warfare History Network, J. G. Bilby, 7/15/23. See generally Exhibit 1 for pictures of Revolutionary War cartridges and cartridge boxes.

Again, the cartridge box was simply a carrying pouch for the soldier's pre-wrapped paper cartridges. It was not a part of the musket or rifle, as a modern magazine is. The cartridge box was not inserted into the firearm like a magazine. It was not inserted into the firearm at all. The modern magazine, usually by its magazine spring and follower, mechanically positions cartridges into position to be chambered when the moving action of the firearm closes. The cartridge box did nothing of the sort. Instead, the soldier removed cartridges from the cartridge box one by one, as he used the cartridges, one by one, to load his musket or rifle by hand.

About the time of the Civil War, paper-wrapped cartridges and muzzle-loaders began to be replaced by breech-loading firearms using self-contained, metallic cartridges. The "modern analog" of the Revolutionary War soldier's cartridge box is not the magazine which, whether fixed or detachable, is a mechanical part of the firearm. The "modern analog" of the Revolutionary War cartridge box is a cartridge pouch, such as those shown in Exhibit 2.

Wounding Capabilities of Revolutionary War vs. Modern Cartridges. In his report, defendants' expert Stephen Hargarten argues, in effect, that the wounding effect and lethality of the modern AR-15 is so greatly out of proportion to that of the muskets known to the Founding Fathers when they wrote the Second Amendment that, had they but known how devastating the AR-15 was, they would never have given the people the right to keep and bear such arms.

Mr. Hargarten's arguments, summarized in the chart entitled "Summary" on the last page of his report, show that his data are inaccurate and his arguments should not be trusted.

His chart begins with three pistol calibers, which he names ".25 Caliber," ".32 Caliber," and ".40 Caliber." As to the first two of these, I note that, assuming he is referring to the .25 Auto (also called .25 ACP, the ACP standing for "Automatic Colt Pistol") and the .32 Auto (or .32 ACP), these are two underpowered, obsolescent pistol calibers, which most firearms experts consider to be inadequate for self-defense use. As to all three pistol calibers included in Mr. Hargarten's chart – the .25, the .32, and the ".40 Caliber" – by which I assume he means to indicate the .40 Auto (also called the .40 S&W) – I note he fails to indicate whether the bullet (projectile) types used for the ballistic gelatin testing were full metal jacketed (FMJ) rounds, jacketed hollow point (JHP) rounds, or some other type. This is significant because the diameter of the temporary cavity, energy lost by bullet while passing through the gelatin, and percentage of energy transferred by the bullet, will all be significantly greater when effectively-performing jacketed hollow points, or other efficient projectile types, are used, compared to full metal jacketed rounds, which produce temporary cavities only modestly larger than their permanent wound cavities.

The biggest problem I have with Mr. Hargarten's chart, however, is the line he entitles "Musket Ball," which he apparently intends the reader to accept as being accurate ballistic data for the musket balls fired in the Revolutionary War, and therefore presumably known to our Founding Fathers when they wrote the Second Amendment. The muskets most commonly used by both sides – that is, the British and the Americans -- in the Revolution were the British "Land Pattern" muskets, popularly known as the "Brown Bess" for reasons which appear to be

historically obscure, and secondarily the French-made Charleville muskets, of which the French gave the American revolutionaries some 25,000 in early 1777. The Brown Bess was nominally a .75 caliber musket (although manufacturing tolerances at that time are said to have varied greatly), while the Charleville was a .69 caliber arm. To allow for efficient ramming home of the musket balls as the musket barrels became fouled with black powder residue in battle, the round lead musket balls used by the troops were often .69 to .71 caliber for the .75 caliber Brown Bess, and .64 caliber for the .69 caliber Charleville muskets.

With that background, we now turn to Mr. Hargarten's chart. On the line titled "Musket Ball," he states the "Bullet Mass" in grams as 3.531 grams. 3.531 grams is 54.49 grains, about the same weight as the most commonly used 5.56mm NATO or .223 Remington ammunition fired in AR-15 rifles. Mr. Hargarten's chart, however, contains, a tremendous understatement of the mass of the musket balls most commonly used in the Revolutionary War. A .69 caliber lead musket ball, the size most often used in the Brown Bess muskets most often used by the colonial troops, weighs about 494 grains – **about nine times the weight of the "musket ball" shown in Mr. Hargarten's chart!** While the exact velocity of a musket ball exiting the muzzle of a Brown Bess musket is a matter of some dispute, and cannot be precisely duplicated today because of the inability to obtain the same gunpowder provided to the troops during the Revolution, velocities in the 800 to 1200 feet per second range seem to represent conservative, knowledgeable estimates. See, e.g., *Range, Power, Penetration, Velocity of a Brown Bess*, N.A. Roberts, J.W. Brown, et al., "Bow vs. Musket, April 29, 2019; *Test Firing Early Modern Small Arms*, P. Krenn, P. Kalas, et al., "Material Culture and Military History," *Muzzle Loading Shooting*, M. Vickery, W. Terry, et al., (1973); and *Small Arms and Ammunition in the United States Service*, Smithsonian Institute, *supra*. Using 1,000 feet per second as a conservative muzzle velocity for the Brown Bess, the muzzle energy in joules of a 494 grain musket ball would be 1,487 joules. While the correctly input bullet mass would invalidate the rest of the line in Mr. Hargarten's chart, if we presumed, as an example, that 77.1% of the musket ball's energy were transferred to the gelatin (which Mr. Hargarten presents as if this presumably duplicates the percentage of energy that would be transferred to the human body with a hit in some unnamed part of the human anatomy), the "Energy Lost by Bullet While Passing thru Gel" in joules – as shown in the next to last column of Mr. Hargarten's chart – would be 77.1% of 1,487 joules, or 1,146.477 joules, **not the tiny 111.27 joules, similar to that of an anemic .32 ACP bullet!** But this calculation is not accurate, as none of the numbers on that line of Mr. Hargarten's chart are accurate. Given that the entire purpose of this chart is to form the foundation for Mr. Hargarten's argument that the AR-15 is so horrifically more powerful, in joules of energy transferred to the target, than a Revolutionary War musket ball, that the Founding Fathers would never have allowed "the people" to keep and bear AR-15s, Mr. Hargarten's argument has no scientific legs on which to stand.

But it gets worse, for several reasons. First, Revolutionary War soldiers on both sides commonly loaded not just a single round lead musket ball, but topped the ball off with several round lead buckshot pellets, creating a so-called "buck and ball" load of the same type often used 90 years later by both Union and Confederate troops in the Civil War. The buck and ball loads increased the likelihood of hits, and can reasonably be assumed to have increased the lethality of the muskets at the close ranges at which they were commonly used. George Washington is said to have directed the colonial troops to load buck and ball from 1777 forward throughout the

Revolutionary War. The weight of a .33 caliber lead buckshot (size 00 buck) is approximately 54 grains. If the .69 caliber lead musket ball used in a Brown Bess musket was supplemented by three such buckshot pellets clustered on top of it in the paper cartridge, the total weight of the projectiles would be 656 grains, and Mr. Hargarten's chart would be even further from accurate.

See Exhibit 3, attached hereto, for a photograph showing the .69 caliber lead musket ball commonly fired from the Brown Bess, plus three .33 caliber lead buckshot that might be added to the musket ball to make up a "buck and ball" load, compared to the 55-grain, full metal jacketed .223 bullet most commonly fired in an AR-15 or similar rifles.

Finally, Mr. Hargarten fails to take into account the fact that a musket-ball or buckshot wound at the time of the Revolutionary War was far more likely to be fatal, or to have crippling consequences such as amputation of limbs, than a similar wound today, due to the greater effectiveness of emergency medical care today. At the time of the Revolution, there were no antibiotics, and medical care was primitive compared to today. The large, relatively slow musket balls often pulled dirty clothing into the wound with them, causing infection. The inability to restore circulation in limbs after blood vessels were severed often resulted in gangrene, treated by amputation of the limb. Compound fractures of bones often resulted in death.

An article by Dr. Atul Gawande published in the New England Journal of Medicine in 2004 entitled *Casualties of War – Military Care for the Wounded from Iraq and Afghanistan*, presented historical statistics on the lethality of wounds suffered in combat by U.S. soldiers since the Revolutionary War, based on U.S. Department of Defense data. The chart published in that article is attached as Exhibit 4. As shown in the chart, lethality from wounds received by U.S. soldiers during the Revolutionary War was 42%, compared to 30% lethality in World War II, 24% lethality during the Vietnam War, and 10% in our wars in Iraq and Afghanistan from 2001 to 2004, when the article was published. The Founding Fathers, at the time they wrote the Second Amendment, were clearly aware of the grievous effect of the muskets and rifles commonly used in the Revolutionary War which had just recently ended. Mr. Hargarten's argument that the Founding Fathers would never have allowed "the people to keep and bear Arms" if they realized how devastating modern arms might be is not supported by the actualities of medical history.

Misinformation About the 5.56mm/.223 Caliber Round, and Other Topics.

Defendants' experts make numerous misstatements about the AR-15's 5.56mm/.223 cartridge, always slanted to make this cartridge appear horrifically devastating, and unsuitable for any legitimate civilian use.

For example, Mr. Yurgealitis states, on page 19 of his report: "Because of the propensity of the 5.56mm/.223 round to create significant damage upon impacting living tissue, it is not generally considered nor favored as a hunting cartridge." See also Yurgealitis Report, p. 50, where he states: "Due to .223 caliber/5/56 mm bullets proven records of causing considerable tissue damage (when fired from an AR type rifle or pistol) it is a counterintuitive choice [for hunting]." Defendants' experts claim that some states ban the 5.56mm/.223 round for big game hunting because it is "too destructive." To the contrary, the truth of the matter is that states that permit rifle hunting for big game, but prohibit the use of the 5.56mm/.223 round

for that purpose, typically do so not because the cartridge is “too destructive,” but because they judge it to be ineffective and therefore inhumane as a big game hunting cartridge.

Regarding the destructiveness of this cartridge when fired at living tissue, destructiveness depends on many factors, including not only bullet weight and velocity, but bullet type (e.g., soft point, hollow point, full metal jacket, polycarbonate tipped) and bullet construction (e.g., the thickness and contour of the bullet jacket, etc.). Bullets (projectiles) for the 5.56mm/.223 cartridge range from 36 grain bullets at 3,750 feet per second (“fps”) or 40 grain bullets at 3,650 fps muzzle velocity (such as the Fiocchi V-Max), intended for hunting of prairie dogs and other small varmint animals, but also used by some police tactical teams and others to reduce the chance of overpenetration in indoor settings, to bullets weighing 75 grains or more, with muzzle velocities in the 2,750 fps range, used for long-range target shooting and hunting deer-sized game. I note here that the most commonly used 5.56mm/.223 round is the 55 grain full metal jacketed bullet, which typically produces muzzle velocities ranging from about 3,250 feet per second when fired in a 20” barreled rifle, to under 3,000 feet per second from a 16” barrel. By way of further comparison, the 5.56mm/.223 cartridge typically produces about 1,200 to 1,300 foot pounds of energy at the muzzle, while the 165 grain bullet from a .308 Winchester, a cartridge widely used for deer hunting, has twice the muzzle energy, about 2,700 foot pounds.

Another misleading piece of ballistic information concerns the maximum range of the 5.56mm/.223 round (properly termed the “maximum extreme range” to differentiate it from “maximum effective range,” which is much less). On page 40 of his report, Mr. Yurgealitis states, “the maximum range of these rifles is 2650-3000 meters. They were not designed, nor are they suitable, for home defense in short range close quarter situations.” To get a bullet to travel 3,000 meters (1.86 miles), one would have to point the rifle’s barrel up in the air at approximately a 40-degree angle. A lowly .22 rimfire (.22 Long Rifle, like Boy Scouts and other children learn to shoot at summer camp) can travel 1.25 miles or more. Even handgun bullets, such as the 9mm or .45 Auto, have maximum extreme ranges of 1.1 to 1.4 miles. The maximum extreme range of a cartridge is not a reasonable gauge of whether or not it is “suitable for home defense in short range close quarter situations,” as Mr. Yurgealitis puts it.

Any of the cartridges commonly used for self-defense can launch bullets into the next neighborhood, or even the next town, if fired up into the air. Hundreds of thousands of soldiers in our military have used 5.56mm/.223 rifles for “short range, close quarter situations” in urban combat and house clearing in Vietnam, Iraq, Afghanistan and elsewhere, and law enforcement agencies nationwide use AR-15 rifles for building entries, for serving search warrants and arrest warrants, and for other self-defense situations at short range, in close quarters. Hundreds of thousands of law-abiding citizens have apparently purchased AR-15 rifles for, among other things, self-defense use in and around their homes, businesses, farms and ranches. Mr. Yurgealitis’ opinion should not prevail over the opinions of our military, our law enforcement agencies, and hundreds of thousands of gun owners on what kind of firearms are suitable for defensive use.

Defendants’ expert Lucy Allen argues, in effect, that because the “average” self-defensive use of a firearm in which shots are fired requires only 2.2 shots, firearms with

magazine capacities over 10 rounds are unnecessary. I note that even trained law enforcement officers miss with most of the shots they fire in actual deadly-force confrontations. While no determinative figures are available on a nationwide basis, individual large law enforcement agencies that have kept their own statistics often show “hit ratios” by police in the range of only 20-35% in officer-involved shootings, meaning that 65-80% of the shots fired by police miss the suspect entirely. See, e.g., Morrison, G., “Police Handgun Qualification: Practical Measure or Aimless Activity?,” *Policing: An International Journal*, Vol. 1, Issue 3, p. 510-533 (1998); Morrison, G., “Latitude in Deadly Force Training: Progress, or Problem,” *Police Practice and Research*, 12(4):341-361 (August 2011). The NYPD, the country’s largest police department, has had individual years when its officer-involved shooting hit ratio has been as low as 11-15%. (Statistics taken from NYPD SOP9 reports, and NYPD “Analysis of Police Combat Situations.”) Firing multiple shots not only increases the chance that the officer will hit the threat altogether, it increases the chance of a hit in an anatomical area that may effectively stop the threat quickly, which is the goal of shooting. Secondly, handgun bullets are notoriously ineffective at causing instant incapacitation of a determined (or drug-crazed, or adrenalin-filled) attacker, so multiple shots are viewed by law enforcement – and by concealed carry and other self-defense handgun instructors -- as more likely to stop the threat before the threat/suspect inflicts deadly damage on the officer, home defender, or other innocent people. I have worked in cases in which trained police officers have hit their attackers with only one or two of the many shots they fired, and other cases in which the fact that a wounded officer’s handgun held 15-18 rounds allowed him to keep his attacker from closing with him and, in all likelihood, killing him.

The argument that no private individual “needs” a firearm with a capacity over 10 rounds because the “average” number of shots fired is 2.2 is, in my opinion, like arguing that the fire department doesn’t need an aerial ladder that reaches higher than the third floor, because there are “only a few” 4-story buildings in town, or that the police department’s SWAT team doesn’t need rappelling ropes longer than 100 feet because there are “only a few” structures in town where that length of rope will leave the officer dangling in midair, because he doesn’t have enough rope to reach the ground.

During the widespread looting and violent criminal attacks in New Orleans that followed Hurricane Katrina, or the looting, arson, and criminal attacks in cities across the United States following the George Floyd incident in May 2020, when police departments were overtaxed or completely unable to respond, many U.S. city dwellers would have viewed themselves as poorly armed indeed if what they had to defend their homes, businesses, and loved ones from mobs of criminals was a 5-shot revolver of the type recommended by defendants’ expert James Yurgealitis for concealed carry, or even the 8-shot revolver he recommends for home defense (see below). And is the private individual supposed to purchase two firearms, one for concealed carry and the other for home defense, as Mr. Yurgealitis’ recommendations appear to suggest?

The fact that Lucy Allen says the average number of rounds needed in a self-defense shooting incident is 2.2 – even if true – does not mean that individuals should not have more rounds, even more than 10 rounds, in case their situation is not the “average” one. “Average” means just that; that there are some instances where the number is smaller, and some where the number is larger. No one should be required to stake their life, or the lives of their loved ones, on an academically-derived “average.”

In addition, I note that the average number of shots, and maximum number of shots, was for those self-defense shooting instances that were statistically studied. There is no way to know that if additional self-defense incidents were studied, some might not be ones in which over ten rounds were fired by law-abiding individuals defending themselves and their families.

I also note that the data on the number of shots fired in the self-defense incidents studied was taken from newspaper articles. Having worked as an expert in shooting incidents for the past 39 years, I have learned that newspaper articles, and in fact “eyewitness” and “earwitness” accounts, are often extremely inaccurate. I have worked in cases in which: (1) an officer who admitted, immediately after the shooting, that he had fired twice, had in fact not fired at all, the shots having been fired by another officer from a different location; (2) in a public, daytime shooting, witness statements to police of how many shots were fired ranged from less than five shots to a dozen or more; and (3) police officers’ accounts of how many shots they have fired, and other details of the shootings, have been grossly inaccurate, often to the detriment of the officer. I have read newspaper articles about how someone “fired both barrels of his pump-action shotgun,” whereas the pump-action shotgun has only one barrel, not two. As an expert in shooting scene reconstruction, and an expert witness in shooting cases for nearly four decades, I certainly would not accept newspaper stories for accurate data on how many shots were fired.

Defendants’ expert Louis Klarevas states, on page 5 of his report, that “in terms of individual acts of intentional criminal violence, mass shootings presently pose the deadliest threat to the safety of American society in the post-9/11 era ...” While Mr. Klarevas’ careful wording of his statement may save it from being an outright untruth, the fact is that tens of thousands of individuals per year are killed by criminals, over 10,000 of them with handguns, while a tiny fraction of that are killed in mass shootings, whether with so-called “assault weapons” or other firearms. For example, FBI statistics show some 20,958 individuals in the United States were homicide victims in 2021, while 103 individuals, excluding the perpetrators, died in active shooter incidents. As stated in an article by the non-partisan Pew Research Center:

Regardless of the definition being used, fatalities in mass shootings in the U.S. account for a small fraction of all gun murders that occur nationwide each year.

What the Data Says About Gun Deaths in the U.S., John Gramlich, April 26, 2023.

Another opinion appearing from time to time throughout defendants’ expert reports is that the 5.56mm/.223 round is inappropriate for home defense because it can penetrate too many walls inside, presumably, the average home. The fact is that a shotgun firing buckshot (recommended by defendants’ expert James Yurgealitis, see below), and any of the commonly-used self-defense handgun rounds (including .38 Special, .357 Magnum, 9mm, .40 S&W or .45 ACP), will all go through one or more sheetrock walls, with enough retained energy to cause death or serious bodily injury in the next room, or sometimes even two rooms away. It behooves anyone firing inside a house or office building to know what is on the far side of any wall toward which he or she is firing. Given the low “hit ratio” in actual defensive shootings (see above), the greatest risk to innocent bystanders is not the risk of overpenetration, but the risk that the shooter

will entirely miss what he or she is shooting at. A 5.56mm/.223 projectile properly selected for indoor defensive use, such as a soft point or hollow point of between 40 and 64 grains weight, will have very little likelihood of overpenetrating (exiting) the human body with a solid torso hit. And the likelihood of hitting, rather than missing, is greatly increased by use of an AR-15, any similar rifle, or a pistol caliber carbine, compared to a handgun, as to which see below.

The American Public Should Not Be Required to Accept Mr Yurgealitis' Choice of Firearms for Self-Defense. On pages 49-50 of his report, Mr. Yurgealitis states his opinions about the types of firearms and ammunition he thinks are the best choices for private individuals for self-defense in their homes, and for concealed carry. The simple fact is that many Americans would, and do, make other choices, and when their lives and the lives of their loved ones are at stake, they should not be required to use the firearms and ammunition Mr. Yurgealitis thinks are best.

First, the Court should not equate Mr Yurgealitis' disparaging "spray and pray" comment (Yurgealitis Report, par. 149, p. 49) with the use of an AR-15 rifle, or with a handgun with a magazine capacity over 10 rounds. Someone using a 5-shot revolver can fire recklessly and hit unintended targets, while someone using an AR-15 or a 15-round magazine capacity Glock 19 can fire carefully controlled, precisely-aimed shots. The AR-15 is currently used by literally thousands of law enforcement agencies, including federal agencies, and most law enforcement agencies use handguns with magazine capacities over ten rounds. Certainly most of the officers in those agencies do not engage in a "spray and pray mentality" when using their firearms. Neither is a "spray and pray mentality" taught in any of the many concealed carry and self-defense firearms classes I have attended over the past 45 years.

For self-defense in the home, Mr. Yurgealitis recommends a pump-action shotgun loaded with 00 buckshot. (Yurgealitis Report, par. 150, p. 49) Moreover, he recommends that this shotgun be kept with its safety disengaged, so the homeowner can just pump a round into the chamber and fire it, and will not have to manipulate the safety in a stressful situation. I have personally used, and have trained hundreds of others, including private individuals, law enforcement officers, private security, and military personnel, to use pump-action shotguns over the past 40 years. I have taught nationwide as a contract instructor for O. F. Mossberg & Sons, one of the shotgun manufacturers Mr. Yurgealitis recommends. I have used, and trained others to use, pump-action shotguns in both of the sheriff's departments in which I have served. I have written technical articles evaluating pump-action shotguns, shotgun ammunition, and shotgun techniques. Based on the foregoing, my comments on Mr. Yurgealitis' opinions are as follows:

- The shotgun is too long and too heavy for many homeowners, especially females, to use comfortably and effectively.
- The shotgun has far too much recoil for many users; this leads them to fire it infrequently, with the result that they fail to achieve competence and adequate levels of familiarity and safety with the gun. This has even been true in many law enforcement agencies.
- 00 buckshot, the ammunition choice Mr. Yurgealitis recommends, will pass through several walls of typical house construction. I have demonstrated this many times to my classes of students using constructed sections of

plasterboard wall with 2x4 studs. I can easily demonstrate this to the Court by video.

- Safely storing a loaded shotgun in the home, especially a home which children or others who are not authorized to use the shotgun, is more difficult than safely storing a handgun in a quick-access lock box. In contrast, safely storing the loaded shotgun usually requires a gun safe.
- Pump-action shotguns are not simple to load, unload, or fire, and human errors in performing these functions are common. Stoppages (“malfunctions”) of the pump-action shotgun are hard for users to clear, especially under stress. These are among many reasons that some law enforcement agencies have switched to semiautomatic shotguns, and far more agencies have abandoned their shotguns altogether, transitioning to AR-15 rifles instead.
- Keeping shotguns with the hammer dropped and the safety disengaged, as Mr. Yurgealitis recommends, involves the significant danger that once the user chambers a round – which he or she should do in any self-defense situation – they are then holding a single-action weapon with a short, light trigger pull, and no manual safety engaged. In most defensive confrontations, what the defender must do with his or her firearm is not fire it. In other words, most defensive confrontations are resolved without shots being fired. Mr. Yurgealitis’ “safety off” method is poorly suited for this. I have personally worked as an expert witness in several cases in which having the safety disengaged on a shotgun has resulted in unintentional deaths, and I know of many others.

Mr. Yurgealitis recommends revolvers for self-defense by private individuals preferring handguns to the shotgun. See Yurgealitis Report, p 49, par. 151. Specifically, he recommends the eight-shot S&W Model 627 or Taurus Model 608, using .357 Magnum or .38 Special +P ammunition. Frankly, these revolvers are much larger and heavier than most private individuals would ever choose to carry concealed for self-defense. As home-defense firearms, I have the following comments about revolvers:

- Both .38 +P and .357 Magnum ammunition will easily penetrate several walls of typical house construction, which is something for which Mr. Yurgealitis criticizes the AR-15.
- Revolvers are considerably harder to shoot accurately than semiautomatic pistols, which is something to which most experienced firearms instructors can attest. This was confirmed by the shooting scores of thousands of law enforcement agencies nationwide when they switched from revolvers to semiautomatic pistols in the 1980’s and early 1990’s.
- The two revolvers Mr. Yurgealitis recommends have grip sizes and lengths and weights of trigger pull that are well suited to many males, but which are too large or too heavy for many female users.
- If revolvers were as efficient as semiautomatic pistols, why is it that one would struggle to find a single law enforcement agency anywhere in the United States that is still using revolvers as their primary issued service handgun?

On page 50, in paragraph 152 of his report, Mr. Yurgealitis mentions the Sig Sauer P229 in .40 S&W caliber, and the S&W Model 640 in .357 Magnum – handguns he was issued as an ATF Special Agent – in discussing firearms for concealed carry. As to these handguns, my comments are as follows:

- The P229, which I carried on duty in sheriff's department service in Indiana, is much larger and heavier than most private individuals would ever consider for concealed carry.
- The .40 S&W caliber round will penetrate several walls, and can endanger innocent persons two rooms away from the shooter, if the shooter misses his intended target.
- The S&W 640 in .357 Magnum has far more recoil than most shooters can handle competently.
- The recoil of the .357 Magnum in a revolver as small as the S&W 640 makes the gun unpleasant, and even painful, for some shooters to fire, to the extent that they will not practice with it often; this will result in the shooter not becoming adequately competent or safe with this revolver.
- The 5-shot capacity of the S&W Model 640 is minimal, at best, for self-defense. Most private individuals who carry a handgun for self defense will not carry a spare, flat magazine for their semiautomatic pistol, let alone a round, bulky speedloader for their revolver.
- Using a speedloader under the stress of a life and death confrontation is very difficult, and many individuals will not be able to perform it without considerable training and practice. "Considerable training and practice" does not describe most private individuals' use of their self-defense handguns.
- The very short sight radius of the S&W Model 640, and the difficulty of firing a revolver altogether, greatly reduce the accuracy with which this revolver is likely to be fired in a life-or-death confrontation. In a case I just finished working on as an expert, a trained police officer, firing a revolver of this size at an attacker who was only 6-8 feet away from him, hit the attacker in the torso with one shot, hit the attacker in the ear lobe with a second shot, and fired a third shot which missed the attacker completely. The two shots other than the torso hit flew through a public parking garage and toward a busy street, with obvious risk to the public. That was the performance of a trained police officer, not a private individual. A snubnosed-revolver such as the S&W 640 is a poor self-defense choice for most private individuals.
- Mr. Yurgealitis' recommendation of a 5-shot revolver for concealed carry, and a shotgun or 8-shot revolver for home defense, means that to follow his recommendations many homeowners and other private individuals would need to purchase two guns, not just one. This presumes that the cost of buying two guns, buying accessories and ammunition for two guns, and training and practicing with two guns, is no problem, which it very well may be.

The point of all my above comments about Mr. Yurgealitis' recommendations of firearms and ammunition for the American public to use for self-defense, whether in their homes or for any other self-defense use, is not that the Court should accept my opinions rather than

those of Yurgealitis. Rather, it is simply that the Court should understand that individuals have their own particular abilities, needs, physical attributes, budgets, and opinions. The American public should not be limited to the firearms that James Yurgealitis thinks are best. His recommendations may, indeed, be excellent choices for him, but not for someone else.

Conclusion

All of the facts and opinions I have expressed in this report are accurate to a reasonable degree of professional certainty in my fields of expertise.

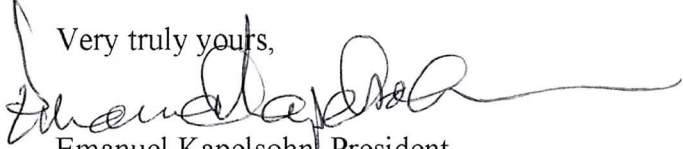
Very truly yours,

Emanuel Kapelsohn President

EXHIBIT 1



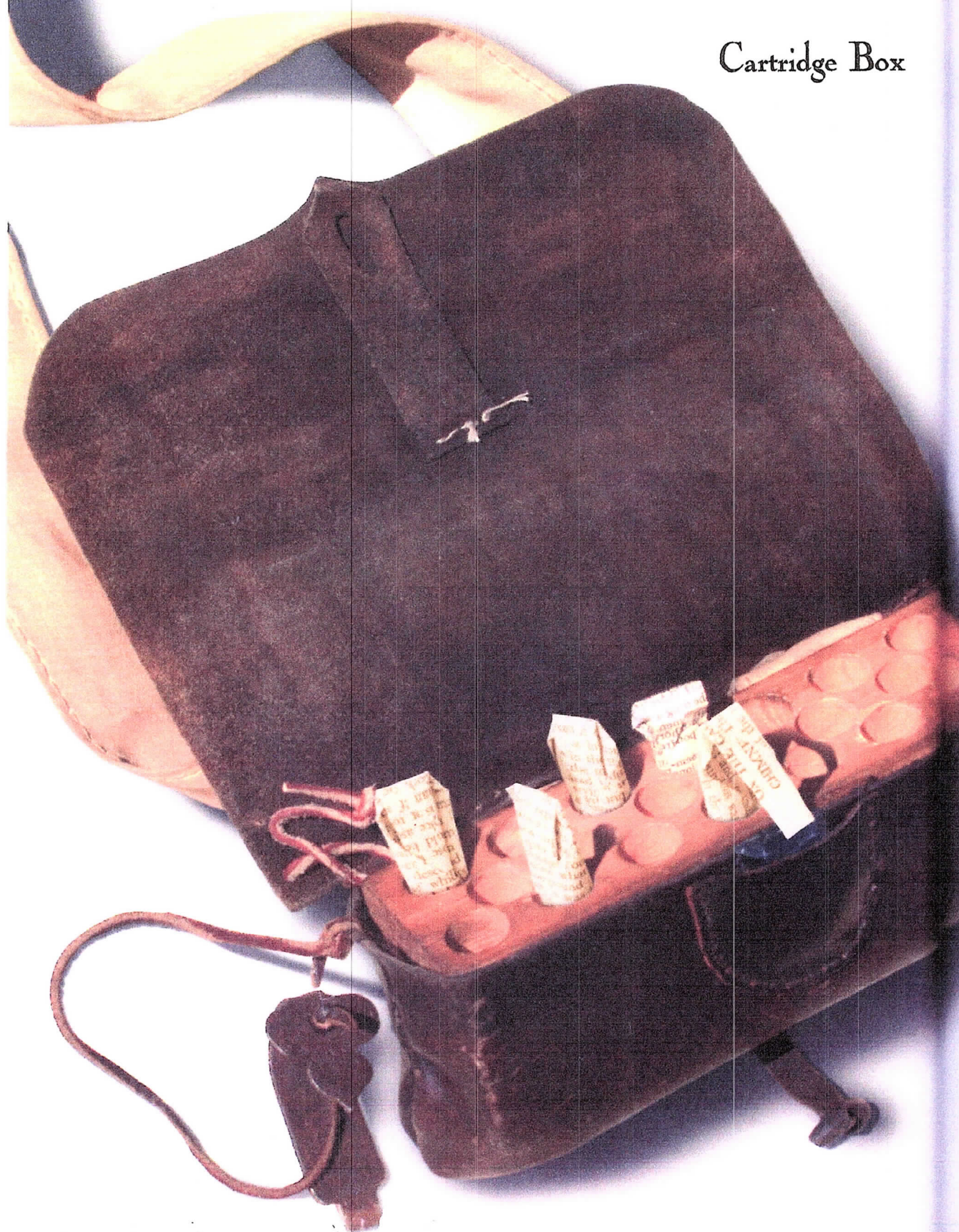
Paper cartridge, with musket ball and buckshot such as might be contained in it. Collection of Washington Crossing Historic Park.



Revolutionary War cartridge box. Collection of Washington Crossing Historic Park.

Revolutionary War cartridge box with five paper cartridges. From
Soldier of the American Revolution, D. Hambucken and B. Payson.

Cartridge Box





Revolutionary War re-enactor with musket and cartridge box. Washington Crossing Historic Park.

Revolutionary War re-enactor removes
cartridge from cartridge box.
Washington Crossing Historic Park.



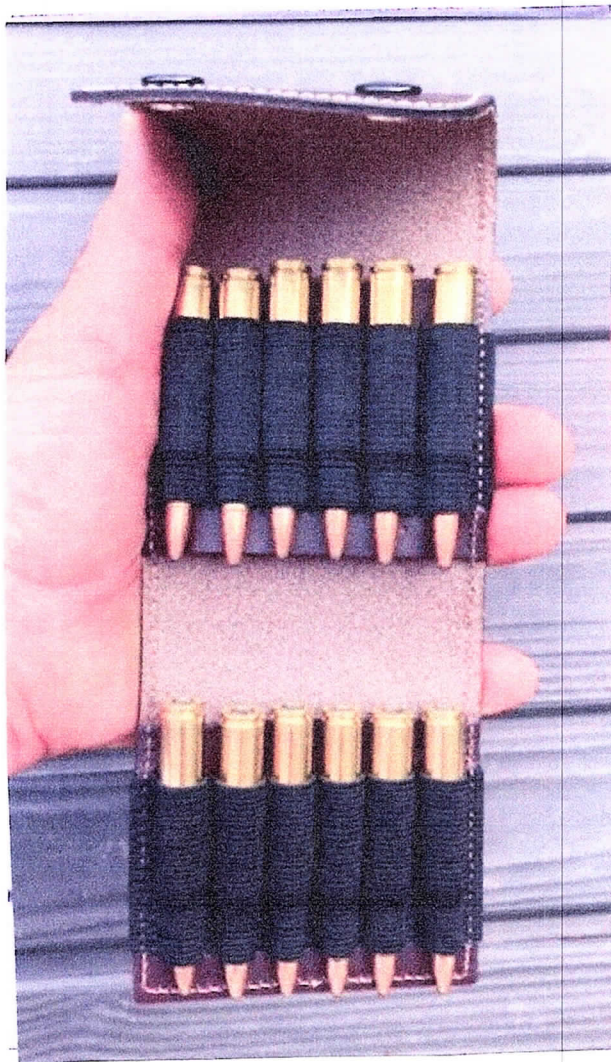


Reproduction Revolutionary War cartridge box with seven paper cartridges. Washington Crossing Historic Park.

EXHIBIT 2

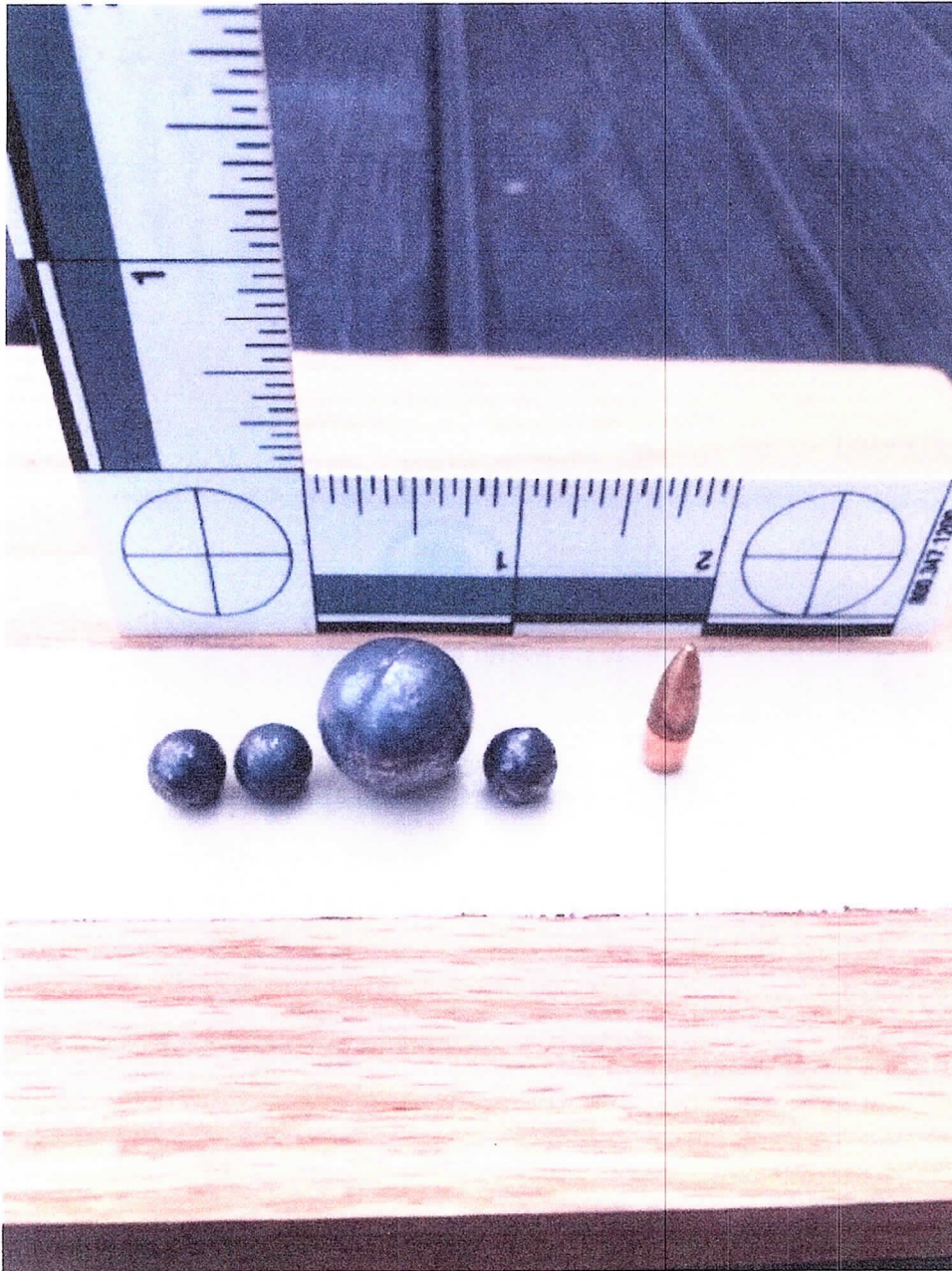


GI-type pouches for 12-gauge shotgun shells.



Modern rifle ammunition belt pouch.

EXHIBIT 3



.69 caliber lead musket ball for Brown Bess, with three lead buckshot for "buck and ball" load, compared to a .223/5.56mm 55-grain full metal jacket bullet.

EXHIBIT 4

| Lethality of War Wounds among U.S. Soldiers.* | | | |
|---|------------------------------------|-------------------------|----------------------------|
| War | No. Wounded or Killed in Action | No. Killed in Action | Lethality of War Wounds |
| | | | % |
| Revolutionary War, 1775–1783 | 10,623 | 4,435 | 42 |
| War of 1812, 1812–1815 | 6,765 | 2,260 | 33 |
| Mexican War, 1846–1848 | 5,885 | 1,733 | 29 |
| Civil War (Union Force), 1861–1865 | 422,295 | 140,414 | 33 |
| Spanish-American War, 1898 | 2,047 | 385 | 19 |
| World War I, 1917–1918 | 257,404 | 53,402 | 21 |
| World War II, 1941–1945 | 963,403 | 291,557 | 30 |
| Korean War, 1950–1953 | 137,025 | 33,741 | 25 |
| Vietnam War, 1961–1973 | 200,727 | 47,424 | 24 |
| Persian Gulf War, 1990–1991 | 614 | 147 | 24 |
| War in Iraq and Afghanistan, 2001– present | 10,369 | 1,004 | 10 |

* Data are from the Department of Defense.^{1,3}